

ABL FOCUS

Vol. VII • No. 5

September/October 2001

ABL CHANGES AFFILIATION

In a brief ceremony at Kirtland Air Force Base, NM on 12 Oct, the Airborne Laser formally ended its nearly decade-long affiliation with the Space and Missile Systems Center (SMC), transitioning its personnel management functions to the Aeronautical Systems Center (ASC) at Wright Patterson Air Force Base, Ohio.



Col Chuck Pinney (ASC Vice Commander), Lt Shawn Beauchamp (ABL Executive Officer) and Col Ellen Pawlikowski (ABL SPO Director)

The move had been in the planning stages almost since the time the Airborne Laser was conceived in the early Nineties but was moved forward this summer when the Air Force transferred SMC to its Space Command. Since ABL was not considered a space program, the transition to ASC was advanced by several years.

Both SMC and ASC were under the Air Force Materiel Command, also based at Wright-Patterson. Under the transition, members of the Kirtland-based ABL System Program Office will transfer to ASC slots but

all personnel will remain in New Mexico.

On 1 Nov 01, ABL funding and program management transfers to the Ballistic Missile Defense Organization (BMDO), a joint service organization under the Office of the Secretary of Defense that oversees missile defense programs for all the services.

Welcome from ASC Commander

On behalf of the men and women of Aeronautical Systems Center, I'd like to offer a hearty and heartfelt welcome to Team Airborne Laser. All of us at ASC are honored to join with you as part of this proud organization, and we're thrilled to have such an exciting and fast moving program become part of this AFMC's Aeronautical Enterprise.

Nearly every Air Force aircraft – past, present and future – has had its roots in Aeronautical Systems Center. We're proud of our long and rich history of delivering air combat power to America's Warrior Airmen – a history which spans the years from the wood and cloth biplanes of World War I, to the B-2s and C-17s in combat over Afghanistan today. And it is preordained that Team ABL will add a tremendously exciting chapter to that history as you bring such a revolutionary new capability to our Air Force's combat might.

Even though we're separated geographically, we're united in a common goal. We are warriors supporting warriors, and our nation is counting on us.

Again, welcome to the team!

*Lieutenant General Dick Reynolds
Commander, ASC*

TEAM ABL COMPLETES BELLY SKIN INSTALLATION

The Aircraft Integrated Product Team (IPT) in Wichita, KS announced the buy-off of the completed belly skin installation on 13 Aug 01. This installation completes another challenging milestone of the ABL program.

The belly skin assembly began when two titanium pieces arrived at the Boeing facility in Wichita, KS in Jun 00. The two skins, manufactured by AHF Ducommun in Gardena, CA, are the largest hot-formed titanium parts in the world. Each skin was fabricated by welding two flat panels end-to-end to achieve the required length, hot-formed to a compound contour, chem-milled to a final thickness and then machined to engineering drawing requirements. Each panel measured 25 feet long by six feet wide, for a combined belly skin assembly of 25 feet by 12 feet. There are 18, 14.7 inch-diameter holes cut into each belly skin to allow for ABL's laser exhaust. Upon arrival, the skins, along with several other titanium parts, were placed onto a special tool and attached

together to create the belly skin assembly.

Eight months of pre-planning was spent on the belly skin. Wichita employees traveled to St. Louis and met with a Boeing group to discuss the use of a Peck Power Feed Drill. This tool performs close tolerance hole reams to within 1000th inch tolerance. Over twelve thousand holes were successfully drilled into the titanium belly skin with this tool. Other processes involved in completing the assembly included the use of a laser tracking to confirm location of the skin relevant to location on the tool; Advanced Technology Assembly (ATA) verification of detail parts; and deburr and installation of fasteners.



Titanium Belly Skin

After the assembly was complete, the original aluminum belly skin from the lower lobe of the aircraft was cut and removed. The new titanium piece was transferred to a cradle tool and lifted into place on the aircraft, using the laser tracker to match the new skin to the existing holes. The new skin matched flawlessly.

Team ABL chose titanium for the lower lobe of the aircraft for its heat capability, strength, chemical compatibility and no-stress corrosion threshold requirements. Assessments to the unmodified structure were made, and areas requiring reinforcements were identified. The new titanium skins were designed to resist buckling around the ejector holes at ultimate load, and will meet 1000 pressure cycles. For ultimate load, the capability of the original skins and stringers were maintained. All modifications restored the airframe

back to its original designed structural capability.

Contributed by Lavonne Bartel, Boeing

ABL KNOCKS 'EM DEAD AT JOINT PROJECT OPTIC WINDMILL VI

Team ABL participated in Europe's premiere Theater Ballistic Missile Defense exercise, Joint Project Optic Windmill VI (JPOW VI), again this year. The event was held in August and September at NAS Sigonella to support the Royal Netherlands Air Force (RNLAf)-planned exercise. The hosting command was COMSIXTH Fleet. The team included personnel from Air Combat Command (ACC), the ABL SPO, the Theater Aerospace Command and Control Simulation Facility (TACCSF), and the Air Force Operational Test and Evaluation Center (AFOTEC).

Key objectives for ABL were to ensure the ABL-AEGIS Link 16 implementations functioned appropriately, to assess link timing, and to develop a basic procedure that would allow manual coordination of missile handovers between the two systems. An additional objective to measure ABL's impact of "clueing" on the Program Database (PDB) 5 PATRIOT was added. With the exception of the timing data, the key objectives were met.



Over a five-day period of working with the *USS Stout*, it was determined that the existing AEGIS Link 16 implementation was fully capable of receiving and acting upon ABL's Space Track Message information. Discussions with the *Stout's* Weapons Officer confirmed that the crew could have used the ABL's Space Track Message to acquire and then shoot at the

inbound TBM. This is significant step forward for ABL's interoperability. This "clueing" capability positively impacts the missile defense's capability to fight in a layered defense. Unfortunately, no reverse "clueing" occurred because of the ship's simulated position.

Contributed by Jim McCormick, ACC/SMO-ABL

OTHER WEAPON SYSTEM DEVELOPMENT NEWS

Aircraft

The modification continues on schedule for a November rollout. The 1000 bulkhead and the modified nose containing the 220 bulkhead were installed on the aircraft. Work continues on the 1000 bulkhead (complete attachment to the aircraft floor/walls and ceiling; installation of the pressure door and routing of the cables and wires through the bulkhead).

Laser

The Laser Module #1 (LM-1) Pressure Recovery System has been modified to perform as required at the nominal ABL operating altitude. Four tests of the high-energy laser have been conducted, and the device has achieved 111% of required power. The ABL Gas Generator modification has been successfully demonstrated at LM-1.

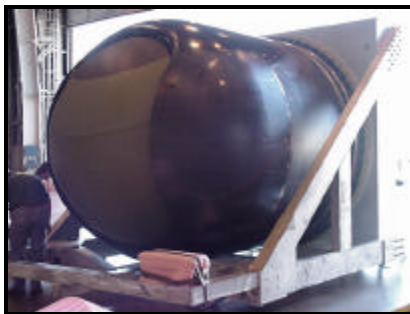
In addition, the first laser plumbing deliveries to the Systems Integration Laboratory were completed with over 5000 feet of field-routed and vacuum system plumbing.

BMC⁴I

The Mission Data Processor began initial testing in the Virtual ABL Facility in August. Software Spiral 7 (initial Beam Control/Fire Control interface) coding is complete and is undergoing verification test, and the computer rack has been delivered and installed on the airplane. Boeing has developed near term work-around utilizing a Display Control Processor to support WITT.

Beam Control / Fire Control (BC/FC)

Ongoing analysis is being conducted to determine the maximum lase time on the newly coated primary mirror. The surrogate turret was successfully delivered to Wichita for integration onto the aircraft for the Nov rollout ceremony. The wavefront sensor was delivered to the Integration, Assembly, Test and Checkout facility in Sunnyvale, CA. Coating of the inner yaw fold mirror was completed, marking the first successful Very Low Absorption (VLA) coating of a flight optic.



Surrogate Turret arrives in Wichita

Wichita Integration and Test Team (WITT)

WITT successfully completed the Pre-Power Review where Boeing commercial experts review the engineering and modifications accomplished. Power was applied to the aircraft batteries signifying power-on and the beginning of ground testing which will lead to first flight. Ground testing will continue to apply power incrementally to the rest of the aircraft. Flight test planning continues on-schedule to allow acquisition of ranges and other resources required to complete the flight testing.

KODAK ALBUQUERQUE INTERNATIONAL BALLOON FIESTA

Team ABL once again participated in the Kodak Albuquerque International Balloon Fiesta, 6-14 Oct. Weather was nearly perfect, and participants had a great experience with over 80 people going up in the contractor-

sponsored ABL balloon. Team ABL also supported Adventures Aloft at Zuni Elementary School in Albuquerque, NM, with over one hundred kids, parents and teachers present; the University of New Mexico ROTC – great pictures taken for the nationwide recruitment effort; and offered “Character Counts” tethered rides – again over one hundred kids, parents and teachers attending. Best of all, Team ABL helped make the wish of a special little girl come true.

“A Special Wish” Selectee Attends Balloon Fiesta

Suffering from a disabling and potentially fatal genetic disorder, the 8-year-old daughter of a United States Air Force employee from Wright-Patterson Air Force Base, Ohio, attended the Albuquerque Balloon Fiesta October under the auspices of A Special Wish Foundation.

Jenna Minges, born with a rare genetic disorder called 10-Quarter Deletion Syndrome that has led to severe heart defects, told the Columbus, Ohio-based foundation that her fondest desire was to attend an event that featured hot-air balloons. The Albuquerque fiesta was chosen because it is the largest of its kind in the world.

Jenna's father, Mark, works for the Air Force Research Laboratory's Information Directorate. One of the laboratory's sister units, the Directed Energy Directorate at Kirtland Air Force Base, NM, and the ABL System Program Office helped host Jenna and her family.



*Jenna Minges and her father, Mark, at the
Albuquerque Balloon Fiesta*

While at the Balloon Fiesta, Jenna attended several events, including the fiesta's opening day Mass Ascension where more than 700 balloons were launched. She was also honored by Top Flight, an ensemble from the Air Force Band of the West at Lackland Air Force Base, Texas, who recognized Jenna on stage and dedicated a selection to her. As an honorary cadet with the Balloon Fiesta Academy, she joined 16 other visiting cadets from throughout the United States to make and fly small paper hot-air balloons.

ABL RESERVES DEPLOY TO SPO

Captain James Thordahl recently became the newest member of ABL's modeling and simulation team. During his most recent tour, he supported several events at the Theater Aerospace Command and Control Simulation Facility including Roving Sands 2001 and Joint National Test Facility's Joint Theater Missile Defense Phase 3. He is quickly becoming an expert on ABL's system performance model and operator-in-the-loop model and will be using his ABL experience to support an effort to integrate ABL in BMDO's Theater Missile Defense System Exerciser next fiscal year.

The ABL Reserve Program consists of twelve Individual Mobilization Augmentees (IMAs) that each work independently for an active duty supervisor. IMAs can be activated individually based on the program's mission requirements. For example, if active duty personnel from ABL were mobilized, a reservist could be called up to fill that person's position at the SPO. At this time, the SPO Director is not planning to activate any IMAs.

Reservists are also subject to involuntary recall based on Air Force Specialty Codes. In the Gulf War, security forces and intel personnel were recalled.

Contributed by Col(R) Eva Wallace

<http://www.airbornelaser.com/>

*To be added to our distribution list, contact
Judy Sherman, Newsletter Editor, e-mail:
judith.sherman@kirtland.af.mil*